The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIC A. JACOBSEN

Appeal No.2006-0603
Application 09/652,773

ON BRIEF

Before THOMAS, HAIRSTON, and MACDONALD, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellant has appealed to the Board from the examiner having twice rejected claims 1, 3 through 5, 8 through 18, 20 through 23, 25 through 29 and 31 through 33, the examiner having allowed claims 2, 6, 7, 19, 24 and 30.

Representative claim 1 is reproduced below:

1. A system for use in wirelessly transmitting a communication signal to a remote transceiver, said system comprising:

an array of transmit antenna elements arranged in a predetermined pattern;

a direction determination unit to determine a direction of the remote transceiver;

a transmit beamformer coupled to said array of antenna elements to generate a transmit beam in the direction of the remote transceiver; and

a power control unit to determine an antenna gain related parameter associated with said transmit beam generated by said transmit beamformer and to adjust a transmit power level of said system based on said antenna gain related parameter.

The following references are relied on by the examiner:

Liebendoerfer et al. (Liebendoerfer)	5,943,020	Aug. 24, 1999
Daniel et al. (Daniel)	6,075,484	Jun. 13, 2000
Roddy et al. (Roddy)	6,127,740	Oct. 3, 2000 (Filed May 28, 1999)
Keskitalo et al. (Keskitalo)	6,345,188	Feb. 5, 2002 (§ 102(e) Nov. 14, 1997)
Charas	6,381,462	Apr. 30, 2002 (Filed Mar. 16, 1999)
Yun	6,463,295	Oct. 8, 2002 (Filed Feb. 6, 1998)

All claims on appeal stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Daniel in view of Yun and Keskitalo, further in view of Charas as to claims

1, 3 through 5, 8 through 13, 15, 16, 18, 20 through 23, 25 through 29 and 31 through 33. To this basic combination of references the examiner adds Liebendoerfer as to claim 14, and separately adds Roddy as to claim 17.

Rather than repeat the positions of the appellant and the examiner, reference is made to the brief and reply brief for appellant's positions, and to the last office action of February 15, 2005 and the answer for the examiner's positions.

OPINION

Based upon the evidence and reasoning of the examiner in the last office action and the answer, we sustain the rejections of all claims on appeal under 35 U.S.C. § 103 as buttressed by the following. Based upon appellant's grouping of the claims as best expressed at pages 1 and 2 of the reply brief, we treat the subject matter of the claims as grouped there. Our review of the reply brief leads us to conclude that it essentially repeats only the substance of the arguments set forth in the principal brief as to the first stated rejection, which encompasses each independent claim 1, 16, 22 and 28 on appeal. No arguments have been presented in the reply brief as to the examiner's responses in the answer to the arguments presented in the brief as to certain dependent claims.

Although we would tend to agree with appellant's general views in the principal brief that the examiner's views expressed in the last office action and answer may be characterized as incomplete or weakly based as to the assessment of each of the references relied upon in the first stated rejection as well as their combinability within 35 U.S.C. § 103, the evidence actually supplied by these references of unpatentability of the presently claimed subject matter in the first stated rejection presents compelling evidence of obviousness of the respectively rejected claims. We therefore do not agree with the appellant's three basic urgings that the examiner has not shown all the elements of the claims among Daniel, Yun, Keskitalo and Charas, that there is no evidence of motivation of the prior art to combine these respective references and their teachings, and that there is a lack of reasonable expectation of success for the combination.

There is no dispute that the examiner has basically taken the position that Daniel teaches the subject matter of representative independent claim 1 on appeal except that this reference is silent as to the ability to provide a power control unit to determine an antenna gain parameter thereby also permitting the adjustment of the transmit power based upon an

antenna gain parameter. See the last office action at page 3, the brief at page 12 and the answer at page 3. A receiver/transmitter module 320 in Figure 3 in Daniel permits the digital beamforming structure 330 in conjunction with the direction of arrival circuitry 340, both of which are controlled by controller 350, to accurately determine the direction of propagation of a received signal to thereby accurately position the corresponding transmitting beam in the direction of the detected beam. Figure 3 of Daniel shows an array of transmitter antenna elements and the ability to determine direction of a remote transmitter thereby guiding a transmit beamformer as claimed. The adjustability of the responsive transmitting beam is well stated at column 4, lines 12 through 17 and column 10, lines 13 through 25. Figure 4 of Daniel also shows the logical flow of the computations necessary to perform these functions. As revealed in the background at column 1 of Daniel, his system operates in the context of phased arrays of antennas to communicate with wireless, mobile users as transmitters and receivers move with respect to each other.

In contrast to appellant's apparent views expressed at page 12 of the principal brief, the examiner does not rely upon Yun or Daniel to teach a power control unit to determine antenna gain parameter and to adjust the transmit power based upon the gain parameter. In fact, as asserted by the examiner, Yun clearly teaches the ability to control power with a signal quality estimation for so-called smart antenna systems (see the title of Yun's patent) which antenna systems comprise multiple antenna arrays as in Daniel. The modular nature of Yun's system is depicted in Figures 1, 2, 3, 5a, 5b, 7a, 8a, 9 and 10 to operate not only in a wireless phone environment but in a wireless local area network as revealed at column 1 of the background of Yun's patent as well as at the last paragraph of column 40.

All of this overlaps with the teachings of Daniel's patent as well. Because the examiner has accurately characterized Daniel's teachings as merely being silent as to the claimed power control unit, we consider that it would have been obvious for the artisan to have utilized the detailed power control capabilities of Yun in the same or similar environments of use to further Daniel's basic aim of providing a more efficient processing for digital beamforming systems to in effect save spectrum and power as generally set forth in Daniel's abstract.

From our review of Yun it appears that this reference also broadly teaches the concept of determining some kind of broadly recited "antenna gain related parameter" as set forth in independent claims 1 and 16 on appeal and certainly the broader yet "parameter" only generally "associated with said transmit beam" in independent claims 22 and 28 on appeal. From our review of Yun it appears to us that the artisan would clearly consider the broadly definable and computed weights and weighing as well as the signal quality determinations to relate to these broadly defined parameters and antenna gain related parameters set forth in the claims on appeal. Although Yun does not appear to expressly use the term antenna gain per se, the bulk of the teachings relate to initial power control and ongoing power control capability being determined based upon a dynamic signal detectability environment to maintain minimum transmitting power usage over time for such wireless usage as noted earlier in this opinion. Clearly, the artisan would have found these teachings as well easily combinable with Daniel because of the earlier-expressed desire of Daniel to make his overall system more efficient and to save spectrum and power.

Although we believe the artisan would clearly understand the just-noted teachings of Yun as relating to antenna gain, the examiner has provided more explicit teachings in the form of Keskitalo and Charas that it was clearly known in the environment of use to determine an antenna gain parameter and to use this to adjust transmitting power. Even the abstract of Keskitalo relates to antenna arrays and the need for steering a signal, clearly compatible with and buttressing Daniel's and Yun's teachings of antenna signal steering. Figure 4 of Keskitalo appears to illustrate the beam steering and forming capabilities expressed in words in Daniel and Yun. The abstract of Keskitalo clearly expresses that the gain of an antenna array is greatest in a specified direction, thus establishing a relationship of power control to the antenna gain parameter associated with the specified direction. Figure 3 of Keskitalo also relates to the other identified teachings of Daniel and Yun because it characterizes Figure 3 of Keskitalo as an adaptive antenna array as noted at the top of column 3 of Keskitalo. This reference also relates to corresponding teachings of phased array antennas clearly compatible with the teachings of Daniel and Yun.

Correspondingly, Charas teaches maximizing the scan angles in Figure 6 with respect to increasing signal quality of each of the fixed subscriber units FSU in the various figures of Charas. The directional antenna lobe arrangement of Figure 6 compares with Keskitalo's Figure 4 and the teachings in word form in Daniel and Yun. The portion of Charas at column 2 of this reference relied upon by the examiner does emphasize and is consistent with the teachings of the other references that the antenna gain factor G can be increased by the use of the directional antennas to produce a generally more narrow antenna beam which is considered a more desirable option than boosting the transceiver power, a realization consistent with the earlier-noted teachings in Daniel, Yun and Keskitalo.

When all of these corresponding teachings of the applied prior art are considered together, we do not agree with appellant's basic views that are expressed at pages 11 through 13 of the brief that the examiner has not shown all of the elements recited in the claims, that the examiner has not provided evidence of motivation in the prior art and has not set forth a reasonable expectation of success of the combination. We therefore do not agree as well with the appellant's urging that

the examiner's interpretation of the various references is based upon and lacks any supporting evidence of the teachings of the particular features in the respective references as well as their combinability within 35 U.S.C. § 103.

As to the features of dependent claim 3, we note that column 20, lines 21 begins a discussion in Yun of government mandated power requirements. Because given power limits for wireless communications in this country are controlled by laws generally established by the FCC, patentability cannot be predicated on such a recitation.

Turning to dependent claim 4, we have outlined earlier the adjustability and the adaptability of various antenna systems in the respective references relied upon. Similarly, as to the features recited in representative dependent claim 5, it is clear that the references analyze respective portions of signals received by each individual antenna arrangement to determine the direction of a remote transceiver as claimed. Correspondingly, the teachings and showings of the respective references outlined earlier would have clearly rendered obvious to the artisan the feature in dependent claim 8 of determining the approximate centeredness of the direction of a remote transceiver.

We turn next to the features of dependent claims 9 through 11. The controller 350 as well as the direction of the arrival estimator 340 in Figure 3 of Daniel all are taught to be conventional processors, including signal processors, known in the art to include serial data ports. The same may be said of the corresponding structures in Figures 1, 2, 9 and 10 in Yun. Note as well the Figure 2 showing of the FSU's of Charas.

Next, the common support structure of the various elements in dependent claim 13 is well known in the art considering the teachings of the references outlined earlier all relate in some manner to wireless telephones or wireless local area networks. As such, the same may be said of dependent claim 14. As to this claim, the teachings of Liebendoerfer merely buttress the teachings of the initial four references relied upon by the examiner in the first stated rejection. Figure 4 of Liebendoerfer shows the arrangement of the antenna structures in this references to be associated with PCMCIA card 40, which may be a part of a wireless local area network as discussed at the top of column 6 of this reference. As to dependent claim 15, the fact that the references teach the adjustability and adaptability

of the directionality of transmitting beams as well as the corresponding adjustability of the power to achieve these beam forming results necessarily requires that the antenna power or gain be variable or adjustable as well.

The examiner's additional reliance upon Roddy as to the determination of an average transmit duty cycle in dependent claim 17 is well taken. As Roddy recognizes, the wireless transmission art recognizes that controlling the power of a transmitted signal has been well known to be controllable by controlling the average transmit duty cycle of the transmitter. As the paragraph at column 4 of Roddy recognizes, as relied upon by the examiner, the art also recognizes that this duty cycle for transmitter power control may be based upon sensed or otherwise determined signal or circuit factors, consistent with the antenna gain characteristic of the other references relied upon.

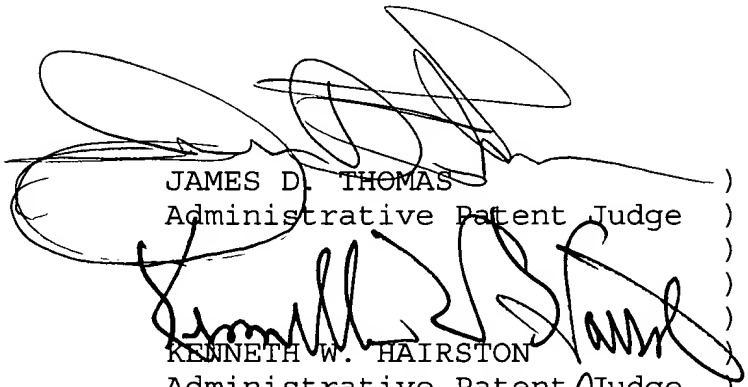
Turning to the features of dependent claim 21, the artisan would have well considered this feature of performing the functionality of parent independent claim 16 from a single indoor location corresponds to the feature of the data processing devices of claims 9 through 12, the common support structure feature of dependent claim 13 and the desktop placement

arrangement in dependent claim 14 for the same reasons. The features of dependent claim 23 have already been discussed with our assessment of its parent independent claim 22. Likewise, we have already addressed the phased array capabilities of the various references as to dependent claim 25 as well as the adaptive antenna arrangements of dependent claim 26. We have also previously addressed the maximum allotted power level of dependent claim 27 in our earlier discussion with respect to claim 3. Lastly, the features of dependent claim 29 have been addressed with our earlier discussion of the broadly claimed "parameter" of its parent independent claim 28.

In view of the foregoing, the decision of the examiner rejecting all claims on appeal under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED



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